Exploring the Extreme			
1998 Science			
Content Standards			
California Science			
Grade 1			
Activity/Lesson	**State**	**Standards**	
Finding the Center of Gravity Using Rulers	CA	SCI.1.IE.4.b	Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will Record observations and data with pictures, numbers, or written statements
Exploring the Extreme			
1998 Science			
Content Standards			
California Science			
Grade 2			
Activity/Lesson	**State**	**Standards**	
Finding the Center of Gravity Using Rulers	CA	SCI.2.PS.1.a	The motion of objects can be observed and measured. As a basis for understanding this concept Students know the position of an object can be described by locating it in relation to another object or to the background
Finding the Center of Gravity Using Rulers	CA	SCI.2.PS.1.b	The motion of objects can be observed and measured. As a basis for understanding this concept Students know an object's motion can be described by recording the change in position of the object over time
Finding the Center of Gravity Using Rulers	CA	SCI.2.PS.1.c	The motion of objects can be observed and measured. As a basis for understanding this concept Students know the way to change how something is moving is by giving it a push or a pull. The size of the change is related to the strength, or the amount of force, of the push or pull
Finding the Center of Gravity Using Rulers	CA	SCI.2.PS.1.f	The motion of objects can be observed and measured. As a basis for understanding this concept Students know magnets can be used to make some objects move without being touched

Finding the Center of Gravity Using Rulers	CA	SCI.2.IE.4.a	Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will Make predictions based on observed patterns and not random guessing
Finding the Center of Gravity Using Rulers	CA	SCI.2.IE.4.e	Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will Construct bar graphs to record data, using appropriately labeled axes
Finding the Center of Gravity Using Rulers	CA	SCI.2.IE.4.g	Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will Follow oral instructions for a scientific investigation
Exploring the Extreme			
1998 Science			
Content Standards			
California Science			
Grade 3			
Activity/Lesson	**State**	**Standards**	
Finding the Center of Gravity Using Rulers	CA	SCI.3.IE.5.b	Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will Differentiate evidence from opinion and know that scientists do not rely on claims or conclusions unless they are backed by observations that can be confirmed

Finding the Center of Gravity Using Rulers	CA	SCI.3.IE.5.c	Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will Use numerical data in describing and comparing objects, events, and measurements
Finding the Center of Gravity Using Rulers	CA	SCI.3.IE.5.d	Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will Predict the outcome of a simple investigation and compare the result with the prediction
Finding the Center of Gravity Using Rulers	CA	SCI.3.IE.5.e	Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will Collect data in an investigation and analyze those data to develop a logical conclusion
Finding the Center of Gravity Using Plumb Lines	CA	SCI.3.IE.5.b	Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will Differentiate evidence from opinion and know that scientists do not rely on claims or conclusions unless they are backed by observations that can be confirmed
Finding the Center of Gravity Using Plumb Lines	CA	SCI.3.IE.5.c	Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will Use numerical data in describing and comparing objects, events, and measurements

Finding the Center of Gravity Using Plumb Lines	CA	SCI.3.IE.5.d	Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will Predict the outcome of a simple investigation and compare the result with the prediction
Changing the Center of Gravity Using Moment Arms	CA	SCI.3.IE.5.b	Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will Differentiate evidence from opinion and know that scientists do not rely on claims or conclusions unless they are backed by observations that can be confirmed
Changing the Center of Gravity Using Moment Arms	CA	SCI.3.IE.5.c	Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will Use numerical data in describing and comparing objects, events, and measurements
Changing the Center of Gravity Using Moment Arms	CA	SCI.3.IE.5.d	Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will Predict the outcome of a simple investigation and compare the result with the prediction
Changing the Center of Gravity Using Moment Arms	CA	SCI.3.IE.5.e	Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will Collect data in an investigation and analyze those data to develop a logical conclusion

Exploring the Extreme			
1998 Science			
Content Standards			
California Science			
Grade 4			
Activity/Lesson	**State**	**Standards**	
Finding the Center of Gravity Using Rulers	CA	SCI.4.IE.6.a	Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will Differentiate observation from inference (interpretation) and know scientists' explanations come partly from what they observe and partly from how they interpret their observations
Finding the Center of Gravity Using Rulers	CA	SCI.4.IE.6.c	Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will Formulate and justify predictions based on cause-and-effect relationships
Finding the Center of Gravity Using Rulers	CA	SCI.4.IE.6.d	Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will Conduct multiple trials to test a prediction and draw conclusions about the relationships between predictions and results
Finding the Center of Gravity Using Rulers	CA	SCI.4.IE.6.e	Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will Construct and interpret graphs from measurements

Finding the Center of Gravity Using Rulers	CA	SCI.4.IE.6.f	Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will Follow a set of written instructions for a scientific investigation
Finding the Center of Gravity Using Plumb Lines	CA	SCI.4.IE.6.c	Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will Formulate and justify predictions based on cause-and-effect relationships
Finding the Center of Gravity Using Plumb Lines	CA	SCI.4.IE.6.d	Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will Conduct multiple trials to test a prediction and draw conclusions about the relationships between predictions and results
Finding the Center of Gravity Using Plumb Lines	CA	SCI.4.IE.6.e	Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will Construct and interpret graphs from measurements
Finding the Center of Gravity Using Plumb Lines	CA	SCI.4.IE.6.f	Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will Follow a set of written instructions for a scientific investigation

Changing the Center of Gravity Using Moment Arms	CA	SCI.4.IE.6.a	Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will Differentiate observation from inference (interpretation) and know scientists' explanations come partly from what they observe and partly from how they interpret their observations
Changing the Center of Gravity Using Moment Arms	CA	SCI.4.IE.6.c	Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will Formulate and justify predictions based on cause-and-effect relationships
Changing the Center of Gravity Using Moment Arms	CA	SCI.4.IE.6.d	Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will Conduct multiple trials to test a prediction and draw conclusions about the relationships between predictions and results
Changing the Center of Gravity Using Moment Arms	CA	SCI.4.IE.6.e	Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will Construct and interpret graphs from measurements
Changing the Center of Gravity Using Moment Arms	CA	SCI.4.IE.6.f	Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will Follow a set of written instructions for a scientific investigation

Exploring the Extreme			
1998 Science			
Content Standards			
California Science			
Grade 5			
Activity/Lesson	**State**	**Standards**	
Jet Propulsion	CA	SCI.5.IE.6.b	Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will Develop a testable question
Jet Propulsion	CA	SCI.5.IE.6.c	Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will Plan and conduct a simple investigation based on a student-developed question and write instructions others can follow to carry out the procedure
Jet Propulsion	CA	SCI.5.IE.6.d	Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will Identify the dependent and controlled variables in an investigation
Jet Propulsion	CA	SCI.5.IE.6.e	Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will Identify a single independent variable in a scientific investigation and explain how this variable can be used to collect information to answer a question about the results of the experiment

Jet Propulsion	CA	SCI.5.IE.6.g	Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will Record data by using appropriate graphic representations (including charts, graphs, and labeled diagrams) and make inferences based on those data
Jet Propulsion	CA	SCI.5.IE.6.h	Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will Draw conclusions from scientific evidence and indicate whether further information is needed to support a specific conclusion
Jet Propulsion	CA	SCI.5.IE.6.i	Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will Write a report of an investigation that includes conducting tests, collecting data or examining evidence, and drawing conclusions
Vectoring	CA	SCI.5.IE.6.b	Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will Develop a testable question

Vectoring	CA	SCI.5.IE.6.c	Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will Plan and conduct a simple investigation based on a student-developed question and write instructions others can follow to carry out the procedure
Vectoring	CA	SCI.5.IE.6.d	Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will Identify the dependent and controlled variables in an investigation
Vectoring	CA	SCI.5.IE.6.e	Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will Identify a single independent variable in a scientific investigation and explain how this variable can be used to collect information to answer a question about the results of the experiment
Vectoring	CA	SCI.5.IE.6.g	Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will Record data by using appropriate graphic representations (including charts, graphs, and labeled diagrams) and make inferences based on those data

Vectoring	CA	SCI.5.IE.6.h	Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will Draw conclusions from scientific evidence and indicate whether further information is needed to support a specific conclusion
Vectoring	CA	SCI.5.IE.6.i	Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will Write a report of an investigation that includes conducting tests, collecting data or examining evidence, and drawing conclusions
Exploring the Extreme			
1998 Science			
Content Standards			
California Science			
Grade 6			
Activity/Lesson	**State**	**Standards**	
Jet Propulsion	CA	SCI.6.ESIE.7.b	Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will Select and use appropriate tools and technology (including calculators, computers, balances, spring scales, microscopes, and binoculars) to perform tests, collect data, and display data
Jet Propulsion	CA	SCI.6.ESIE.7.e	Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will Recognize whether evidence is consistent with a proposed explanation

Vectoring	CA	SCI.6.ESIE.7.b	Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will Select and use appropriate tools and technology (including calculators, computers, balances, spring scales, microscopes, and binoculars) to perform tests, collect data, and display data
Vectoring	CA	SCI.6.ESIE.7.e	Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will Recognize whether evidence is consistent with a proposed explanation
Exploring the Extreme			
1998 Science			
Content Standards			
California Science			
Grade 7			
Activity/Lesson	**State**	**Standards**	
Jet Propulsion	CA	SCI.7.LSIE.7.a	Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will Select and use appropriate tools and technology (including calculators, computers, balances, spring scales, microscopes, and binoculars) to perform tests, collect data, and display data
Jet Propulsion	CA	SCI.7.LSIE.7.b	Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will Use a variety of print and electronic resources (including the World Wide Web) to collect information and evidence as part of a research project

Jet Propulsion	CA	SCI.7.LSIE.7.c	Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will Communicate the logical connection among hypotheses, science concepts, tests conducted, data collected, and conclusions drawn from the scientific evidence
Vectoring	CA	SCI.7.LSIE.7.a	Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will Select and use appropriate tools and technology (including calculators, computers, balances, spring scales, microscopes, and binoculars) to perform tests, collect data, and display data
Vectoring	CA	SCI.7.LSIE.7.b	Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will Use a variety of print and electronic resources (including the World Wide Web) to collect information and evidence as part of a research project
Vectoring	CA	SCI.7.LSIE.7.c	Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will Communicate the logical connection among hypotheses, science concepts, tests conducted, data collected, and conclusions drawn from the scientific evidence

Vectoring	CA	SCI.7.LSIE.7.e	Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will Communicate the steps and results from an investigation in written reports and oral presentations
Fuel Efficiency	CA	SCI.7.LSIE.7.c	Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will Communicate the logical connection among hypotheses, science concepts, tests conducted, data collected, and conclusions drawn from the scientific evidence
Exploring the Extreme			
1998 Science			
Content Standards			
California Science			
Grade 8			
Activity/Lesson	**State**	**Standards**	
Jet Propulsion	CA	SCI.8.PC.1.a	Students know position is defined in relation to some choice of a standard reference point and a set of reference directions.
Vectoring	CA	SCI.8.PC.1.a	Students know position is defined in relation to some choice of a standard reference point and a set of reference directions.
Center of Gravity, Pitch, Yaw	CA	SCI.8.PC.1.a	Students know position is defined in relation to some choice of a standard reference point and a set of reference directions.
Fuel Efficiency	CA	SCI.8.PC.1.f	Students know how to interpret graphs of position versus time and graphs of speed versus time for motion in a single direction.
Fuel Efficiency	CA	SCI.8.PC.2.e	Students know that when the forces on an object are unbalanced, the object will change its velocity (that is, it will speed up, slow down, or change direction).
Fuel Efficiency	CA	SCI.8.PCIE.9.e	Construct appropriate graphs from data and develop quantitative statements about the relationships between variables.